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Median Barrier Guidelines (REVISED)

I. Introduction

A. Purpose

To modify the Washington State Department of Transportation's (WSDOT's) guidelines for the installation of median barrier.

B. Background

Currently, guidelines for the use of median barrier on full access control, multilane highways are provided in Chapter 700 of the WSDOT *Design Manual*. These guidelines are essentially the same ones that were adopted in 1975 and were based on a study of California median crossovers performed in the late 1960's. The current WSDOT guidelines are also consistent with the AASHTO *Roadside Design Guide*.

Figure 700-7 of the *Design Manual* indicates that median barriers are warranted based on a combination of median width and ADT. Medians less than 30' wide and with an ADT of greater than 20,000 generally warrant a median barrier. For median widths greater than 30', median barrier is considered optional.

Review of accident history on Washington State highways and of practices in other states suggests that an increased use of median barriers is desirable. In addition, a current NCHRP project is scheduled for completion in the summer of 2001 and it is anticipated that this study will result in a change to the AASHTO guidelines.

Based on the accident history and practices of other states, this *Design Manual* Supplement changes the current median barrier policy. It is recognized that this policy might be revised again based on the results of the NCHRP study.

C. References

Design Manual, M 22-01, WSDOT

D. Implementation

This policy applies when the Standard Run column on the design matrices indicates EU (evaluate upgrade) or F (full design level). See *Design Manual* Chapter 325 for the design matrices.

Implementation of this revision will be phased to reduce impacts to projects currently in the 01-03 program.

For projects that are included in the department's 01-03 Capitol Construction Program (programs I and P), the median barrier may be programmed under a separate project as long as the work is completed within two years after the completion of the paving project. If median barrier is addressed in a separate project, maintain a separate documentation file that addresses the separation of work during the two-year time period.

For projects being developed for 03-05 this policy is effective immediately and will be funded out of the Improvement (I) program.

II. Instructions

A. Revise *Design Manual* Chapter 700

Delete Figure 700-7.

Replace 700.06 with the following.

Medians must be analyzed for the potential of an errant vehicle to cross the median and encounter oncoming traffic. Median barriers are normally used on full access control, multilane, high-speed, high traffic volume facilities. These facilities generally have posted speeds of 45 mph or greater. Median barrier is not normally placed on collector highways or other facilities that do not have full access control. Providing access through median barrier requires openings and, therefore, end-treatments.

Provide median barrier on full access control, multilane highways with median widths of 50' or less and posted speeds of 45 mph or more. Consider median barrier on highways with wider medians or lower posted speeds when there is a history of cross median accidents.

When installing a median barrier, provide left-side shoulder widths as shown in Chapters 430 and 440 and shy distance as shown in Chapter 710. Consider a wider shoulder area when the barrier casts a shadow on the roadway and hinders the melting of ice. See Chapter 640 for additional criteria for placement of median barrier. See Chapter 710 for information on the types of barriers that can be used. See Chapter 650 for lateral

clearance on the inside of a curve to provide the required stopping sight distance.

When median barrier is being placed in an existing median, identify the existing crossovers and enforcement observation points. Provide the necessary median crossovers in accordance with Chapter 960, considering enforcement needs.

B. Revise *Design Manual* Chapter 710

Add the following to the list of references in 710.04(2)(b).

700.06 Median Barrier Guidelines

Add the following to 710.05.

(5) Median Barrier Selection and Placement Considerations

As with all barriers, the most desirable installation uses a system that is the most flexible system appropriate for the location and is placed as far from the traveled way as practical. With median barriers, the deflection characteristics and placement of the barrier for one traveled way can have an impact on the opposing traffic. In addition, the median slopes and environmental issues might influence the type of barrier that is appropriate.

In narrow medians, the deflected system must not become a hazard to oncoming traffic. In addition, narrow medians provide little space for maintenance crews to repair or reposition the barrier. Avoid installing deflecting barriers in medians that provide less than 8 ft from the edge of the traveled way to the face of the barrier. In wider medians, the selection of barrier might depend on the slopes in the median.

In locations where the median slopes are relatively flat (1V:10H or flatter), unrestrained precast concrete barrier, beam guardrail, and cable barrier can be used depending on the available deflection distance. In these locations, position the barrier as close to the center as possible so that the recovery distance can be maximized for both directions. It is understood that the barrier might have to be offset from the flow line to avoid impacts to the drainage flow. Cable barrier is preferred with medians that are 30' or wider. For medians wider than 30', provide justification for placing a barrier closer than 15' from the edge of the traveled way.

In wide medians where the slopes are steeper than 1V:10H but not steeper than 1V:6H, cable barrier placed near the center of the median is preferred. Placement of beam guardrail requires that the barrier be placed

at least 12' from the slope break as is shown on Figure 710-4. Do not use concrete barrier in locations where the foreslope into the face of the barrier is steeper than 1V:10H. For medians wider than 30', provide justification for placing a barrier closer than 15' from the edge of the traveled way.

In locations where the roadways are on independent alignments and there is a difference in elevation between the roadways, the slope from the upper roadway might be steeper than 1V:6H. In these locations, position the median barrier along the upper roadway and provide deflection and shy distance as discussed previously. Barrier is generally not necessary along the lower roadway except where there are fixed objects in the median.